General Science

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Q. What are food additives?

Food additives: Food additives are substances added to food products during the processing or manufacturing stage to improve the taste, texture, appearance, or shelf life of food. Food additives undergo rigorous testing for safety before they are approved for the use in food industry. Some common categories of food additives are described below:

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a) Preservatives: These additives help prevent spoilage and extend the shelf life of food products by inhibiting the growth of bacteria, fungi or other micro-organism.

b) Coloring: Food colors are added to enhance the color of food products. They can be natural or synthatic.

c) Flavoring: Flavour enhancers are added to improve or modify the taste of the food. This category include both natural flavours (drived from plants or animali) and artificial flavours

(chemically synthesised).

d) **Thickners:** These additives help maintain the texture and consistency of food products. They can prevent saperation and improve overall quality of the product.

e) **Sweetners:** Sweetners are used to add sweetness to food and baverages. They can be natural inthe form of sugar and honey, or artificial.

Q- What are food preservatives?

Food Preservatives: Food preservatives are substances added to food items to prevent food sppilage, deterioration, or contamination by bacteria, fungi or other micro organisms. The use of food preservatives helps extend the shelf life of products, maintain their quality, and ensure they remain safe for consemption. Some common categories of food preservatives are as below.

a) **Antimicrobial preservatives:** These inhibit the growth of bacteria, molds or yeast in food. common antimicrobial presevatives include sodium benzate, Potassium benzoate and sulphur dioxide etc.

b) Antioxidants: helps prevent oxidation of fats and oils in food which can lead to off-flavors. Common antioxidants used are Vitamin-C, Vitamin-E etc

c) Salt and Sugar: High concentration of salt and sugar act as preservatives by reducing water activity in food, making it less favorable for the growth of microorganism. Salt is commonly used in curing meats and fish, while sugar is used in jams, jellies and syrups.

d) Acidulants: Acidic conditions can inhibit the growth of microorganisms. Citric acid, Lactic acid and Acetic acid (Vinger) are commonly used acidulants.

e) Natural preservatives: Some natural substances have inherent antimicrobial properties and can act as preservatives. examples are: Rosemary, Vinegar, honey, salt-cured methods.

Q: GIS and its components.

GIS: GIS 'Geographic information system' is a technology that captures, analyses, stores, manages and presents spatial or

geographic data.

Components of GIs:

1- Hardware:

a- Computers: GIs requires computers with sufficient processing power and storage capacity to handle spatial data and run GIs software.

b- Input Devices: Such as digitizers, scanners, and GPS "Global positioning system" are used to collect spatial data.

2- Software:

a- GIs software: specialized GIs software applications such as ArcGIs, QGIs, Arcmap are used for data input, analysis, visualization and map creation.

b- Database Management systems used to store and manage both spatial and attribute data.

3- Data:

a- Spatial data: are the geographic data representing the location and shape of features on the surface of the earth. They can include Points, lines, Polygons and raster data

b- **attribute data:** are non spatial information associated with spatial features. It provides additional details about features.

4) People:

a) <u>GIs Professionals:</u> individuals with expertise in geospatial technology, cartography, geography and data analysis.

a) <u>End Users:</u> People from various feilds who use GIs tools and maps for decision making planning and analysis. It maybe government officials, urban planners, environmental scientists etc.

5) Methods & Procedures:

a) <u>Data collection:</u> Process of gathering spatial and attribute data using methods such as GPs surveys, remote sensing and feild survey etc.

b) <u>Data Analysis:</u> Technique for interpreting spatial data

c) <u>Map production:</u> creating maps for visualization and communication of spatial information.